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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,171	05/22/2000	Lawrence E. Myers	LWE-110	2275

7590

09/11/2002

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EXAMINER

MENEFEE, JAMES A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 09/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/576,171

Applicant(s)

MYERS ET AL.

Examiner

James A. Menefee

Art-Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.



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TECHNOLOGY CENTER 2800**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

## **DETAILED ACTION**

### ***Specification***

The disclosure is objected to because of the following informalities: On page 6, under the brief description of the drawings, the descriptions of Figs. 1A and 1B should be switched.

Appropriate correction is required.

### ***Double Patenting***

Applicant is advised that should claims 9-11 be found allowable, claims 34-36 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

### ***Claim Objections***

The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 9-12 (second occurrence of each) and 13-33 have been renumbered 12-36 respectively.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The independent claims 1, 12, and 22 only state that the structure of the substrate is modified. It is not clear in what way it is modified, or how this modification is different from a typical substrate of a saturable reflector.

Claims 6 and 29 recite the limitation "front and back surfaces". There is insufficient antecedent basis for this limitation in the claims. This should read "first and second surfaces".

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-4, 9-12, 14-15, and 34-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Alcock et al. (previously cited US 5,901,162). Alcock discloses the claimed invention as follows:

Regarding claims 1 and 3-4, Alcock discloses in Fig. 1 a saturable reflector comprising a substrate 1 having a first surface and a second surface, and a reflector attached to the substrate, the reflector including a saturable absorption layer. One of the surfaces of the substrate has an AR coating 2 disposed thereon, said AR coating 2 being made of dielectric material. Said AR coating 2 is a modification of the surface of the substrate 1 that will inherently enhance the etalon effect.

Regarding claims 9 and 34, the reflector is a saturable Bragg reflector (col. 2 lines 20-25).

Regarding claims 10 and 35, the reflector 7 includes a dielectric film (col. 3 lines 18-30).

Regarding claims 11 and 36, the substrate 1 is 500 microns thick (col. 2 lines 65-66).

Regarding claims 12 and 14-15, Alcock discloses the limitations as in the rejection of claims 1 and 3-4 above, but does not explicitly disclose using the etalon effect to control a spectrum of radiation from the laser. However, it is inherent that the spectrum radiated from the laser depends on the etalon effect. Therefore the etalon effect will necessarily control an output spectrum of the laser.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcock.

Alcock discloses the limitations of claims 1, 3-4, 9-12, 14-15, and 34-36 as shown above, but does not disclose that the substrate be polished. However, it is well known that substrates are often polished prior to an AR coating being placed thereon. It would have been obvious to one skilled in the art to polish the substrate so as to provide a good interface removing certain imperfections from the face, as is well known.

Claims 5-8 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcock in view of Weingarten et al. (US 6,393,035). Alcock discloses the limitations of claims 1, 3-4, 9-12, 14-15, and 34-36 as shown above, but does not disclose the following:

Regarding claims 5-8 and 16-18, it is not disclosed that there are means for tuning the etalon effect, particularly a heater or cooler element with a temperature controller for adjusting the optical thickness of the substrate. Weingarten teaches a saturable reflector having portions that are temperature tuned (col. 5 lines 29-62). It is inherent that temperature tuning may be done by a heating or cooling element having a temperature controller. It would have been obvious to one skilled in the art to temperature tune the material of the saturable reflector because this allows for an optimization of the modulation depth of the device, leading to the advantages given in lines 57-62, as taught by Weingarten.

Regarding claims 19 and 21, it is not disclosed that the tuning will adjust the values as claimed. Examiner contends that should the device be tuned, as shown to be obvious in the above claim rejections, then the values as claimed will necessarily be adjusted.

Regarding claim 20, it is not disclosed that the tuning optimizes a relationship between temporal and frequency domains. It would have been obvious to one skilled in the art to tune the device such that this relationship is optimized, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claims 22, 25-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten in view of Alcock.

Regarding claim 22 and 26-27, Weingarten discloses a laser system as in claim 22, comprising an optical cavity, a lasing medium 2 disposed in said cavity, a pump 1 providing pump radiation to the lasing medium, and a saturable reflector 4 optically coupled to the cavity. The saturable reflector 4 is not disclosed to be as claimed in claim 22. Alcock discloses the limitations of the saturable reflector as in the rejection of claim 1 above. It would have been obvious to one skilled in the art to substitute Alcock's saturable reflector into Weingarten because Alcock's reflector is more reliable and less costly than a typical saturable reflector, as taught by Alcock.

Regarding claim 25, the limitations are taught with motivation as in the rejection of claims 2 and 13 above.

Regarding claims 28-31, Weingarten discloses that the saturable reflector may be thermally tuned and adjusted with the advantages as given in the rejection of claims 5-8 and 16-21 above.

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Regarding claims 32-33, Alcock discloses the substrate to be 500 microns thick. Therefore the substrate has a thickness large enough to act like an etalon having a free spectral range of the same order as a linewidth of the laser, i.e. 1 GHz.

Claims 23-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weingarten and Alcock as applied to claims 22, 25-27, and 32-33 above, and further in view of Kortz et al. (US 5,848,079). Alcock teaches the limitations of claim 22 but does not disclose the laser cavity having a nonlinear crystal, specifically the type of crystal as claimed. Kortz teaches a laser cavity that includes a nonlinear crystal made of lithium borate (col. 4 lines 1-24). It would have been obvious to one skilled in the art to include such a nonlinear crystal in the laser cavity because it provides frequency multiplication, as taught by Kortz.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art made of record each disclose laser systems including some type of saturable absorbing element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the



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organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM  
September 3, 2002

  
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